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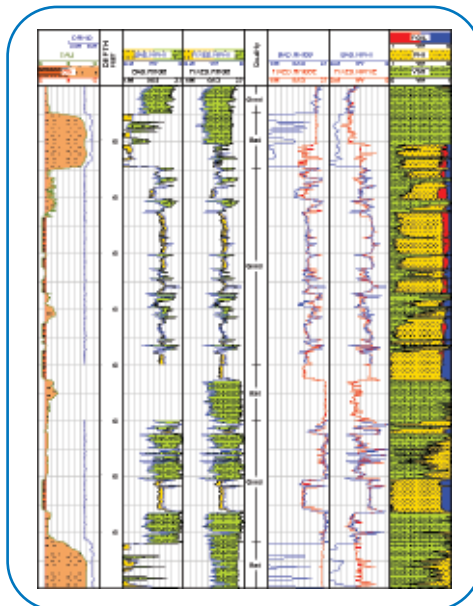
Petrophysics

Introduction

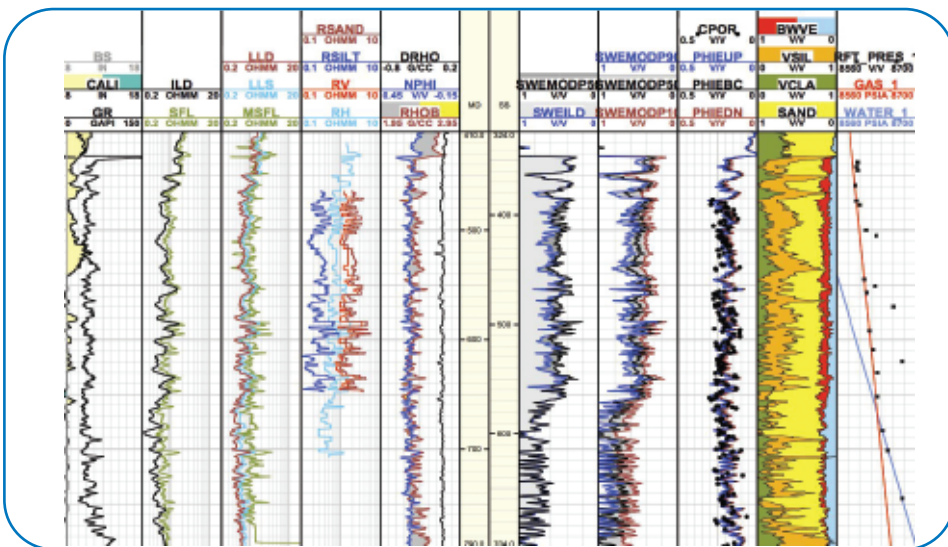
Formation evaluation has been a core component of the Baker RDS service provision for well over 10 years. The nature of the activity locates it at the very heart of the business with tight integration to our geoscience, reservoir engineering, seismic, drilling and production technology services. This integration has forged a whole range of specific products and services which add exceptional value for our clients. Our experienced team draws on expertise from backgrounds in wireline, data analysis and core analysis. It includes core materials specialists and operations expertise. The team has access to a range of industry leading technologies including proprietary codes so that the most appropriate workflows can be deployed to meet the technical challenges that we are presented with. In addition to a range of key service areas outlined below, the team is also engaged in the development of new workflows and bespoke solutions for specific field and well applications.

Operational Support

We support log and core data acquisition and Quality Control activities, spanning data acquisition planning and design to final data QC. We also provide data audit and repair for old data sets.



Log QC and repair



Resistivity modelling and saturation evaluation in thinly bedded formation

Our expertise includes:

- > Log QC and Repair
- > Deterministic Log Analysis
- > Probabilistic Log Analysis
- > RCA/SCAL Planning & QC
- > Facies Analysis & Rock Typing
- > Permeability Prediction
- > Saturation-Height Modelling
- > Wettability Modelling
- > NMR Interpretation
- > Formation Damage
- > Pressure Analysis
- > Borehole Image Interpretation
- > Resistivity Modelling
- > Geosteering Support
- > Equity Studies
- > Due Diligence Studies
- > Data Room Support
- > Training

We also work closely with our:

- > Geologists
- > Geophysicists
- > Geomechanic Engineers
- > Reservoir Engineers
- > Drilling Engineers

Our studies add value to:

- > Static Reservoir Models
- > Dynamic Reservoir Models
- > Petro-acoustic Models
- > Geomechanic Models
- > Field Acquisition Studies
- > Equity Studies

Integrated Petrophysical Evaluations

We add significant value by providing integrated petrophysical evaluations that honour all available log and core data. Clastic, carbonate and complex lithology reservoirs are evaluated using deterministic or probabilistic petrophysical models: depending on the specific requirements.

Electrofacies Analysis, Rock Typing and Permeability Prediction

We identify different reservoir facies by the integration of all geological, reservoir and petrophysical data. We apply Sedimentological studies and Flow Zone Indicators to analyse core data and Clustering Algorithms to analyse logs (electro-facies). The same algorithms are used to predict permeability. We use the results to populate reservoir static and dynamic models with facies-specific Permeability and Saturation-Height models.

Core Analysis QC and integration

We incorporate this expertise within the Petrophysics team to ensure rapid and effective integration of derived parameters and models using state of the art interpretation techniques. This extends to inputs for static and dynamic reservoir models.

Appropriate acquisition programmes, plus rapid and effective integration of core data, add significant value to any formation evaluation project.

Saturation Height Models

We perform rigorous audit and quality control on SCAL data. We derive robust and coherent Saturation Height (SHT) models from expertly selected samples. In absence of core data, SHT functions are evaluated from log data. Facies-specific SHT models are generated in conjunction with Facies Analysis and Permeability prediction.

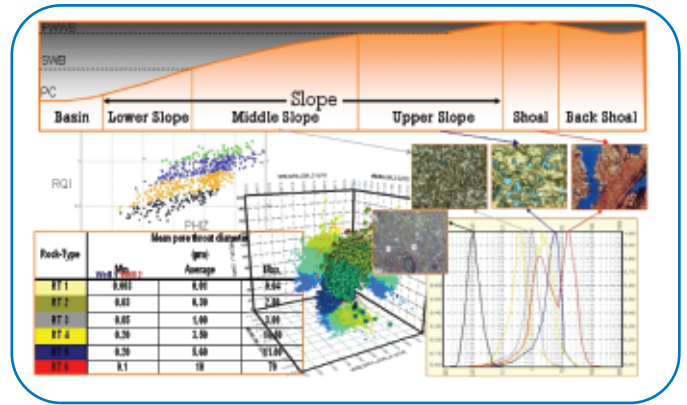
Wettability and Recovery of OIP

Knowledge of reservoir wettability is critical to understanding and predicting recovery of Oil In Place (OIP). Standard SCAL laboratory practice commonly over-estimates oil wetness. This leads to poorer expected prediction of OIP recovery. Expertly designed and managed SCAL ensures that uncertainty in recovery of OIP due to wettability is minimised. We apply learning from the most current research in this field. We also expertly review vintage SCAL data to verify if it is fit for purpose.

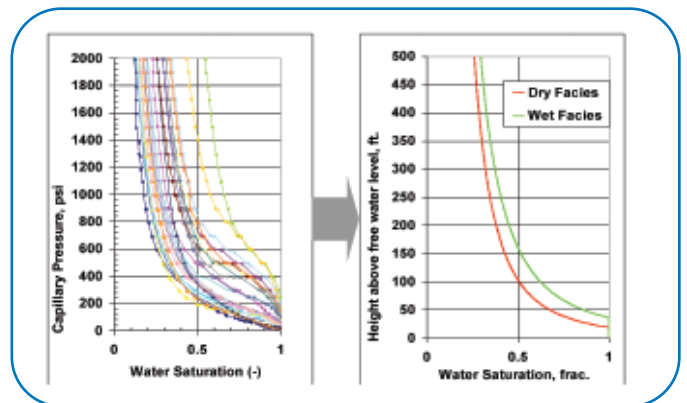
In a recent study the extensive database indicated strong oil wetness. In fact the refined database showed the reservoir to be weakly water wet. This equated to an additional oil recovery of 5 MMbbl.

Summary

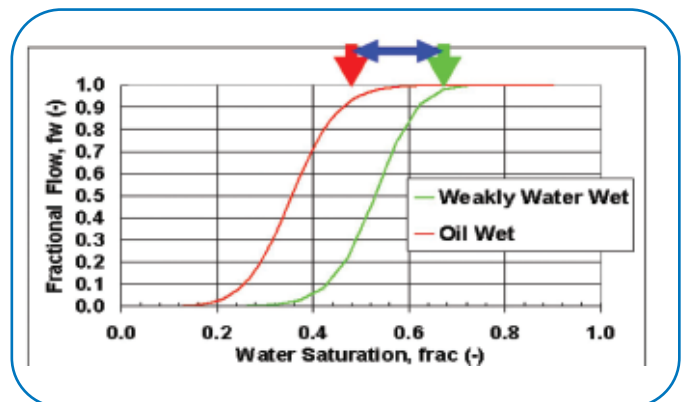
Formation evaluation is a highly integrated discipline. At RDS, our petrophysics service has been developed in a highly integrated environment. This service is available to our own reservoir and wells consultancy teams and to clients directly. If you would like any further information or would like to speak to somebody about a Formation Evaluation issue, please contact us at petrophysics@baker-rds.com



Rock Typing and Permeability Prediction



Convert raw SCAL data to Saturation Height Model



Impact of Wettability on Recovery